

**What is claimed is:**

1       1. An electret comprising a first polymer  
2 copolymerizing from monomers comprising:  
3       VdF as a first monomer; and  
4       HFP, CTFE, TFE, or combinations thereof as a second  
5 monomer.

1       2. The electret in claim 1, wherein the content of  
2 VdF in the first polymer is between 10 mole% and 80 mole%.

1       3. The electret in claim 1, wherein the content of  
2 HFP in the first polymer is approximately 30 mole% or less.

1       4. The electret in claim 1, wherein the content of  
2 CTFE in the first polymer is approximately 30 mole% or less.

1       5. The electret in claim 1, wherein the content of  
2 TFE in the first polymer is approximately 40 mole% or less.

1       6. The electret in claim 1, wherein the monomers  
2 further comprise a third monomer comprising cyclohexyl vinyl  
3 ether, 4-hydroxybutyl vinyl ether, ethyl vinyl ether, methyl  
4 methacrylate, butyl acrylate, 4-hydroxyl ethyl  
5 methacrylamide, glyceryl methacrylamide, acrolein, butyl  
6 vinyl ether, propionic vinyl ether,  $\alpha,\alpha$ -dimethylpropionic  
7 vinyl ether, or combinations thereof.

1       7. The electret in claim 6, wherein the content of  
2 the third monomer in the first polymer is approximately 30  
3 mole% or less.

1       8. The electret as claimed in claim 1, wherein the  
2 content of fluorine element in the first polymer is between  
3 60 and 76 wt%.

1       9. The electret in claim 1, wherein the electret is  
2 porous material.

1       10. The electret in claim 9, wherein the electret is  
2 porosified by solvent, supercritical fluid, or thermal  
3 decomposition.

1       11. The electret in claim 1, further comprising a  
2 second polymer mixed with the first polymer, the second  
3 polymer comprising polymethacrylate, polyvinyl acetate,  
4 polycarbonate, polyurethane, polyester, polyimide,  
5 poly(butylene terephthalate), or polystyrene.

1       12. The electret in claim 11, wherein the content of  
2 the second polymer therein is approximately 60 wt% or less.

1       13. The electret in claim 1, wherein the electret is  
2 soluble in ethyl acetate, acetone, methyl ethyl ketone,  
3 methyl isobutyl ketone, 1-methyl-2-pyrrolidone, dimethyl  
4 sulfoxide, dimethylformamide, or combinations thereof.

1       14. The electret in claim 1, wherein initial surface  
2 potential thereof is between 1350 and 2950V when polarized  
3 by corona discharge under potential difference approximately  
4 of 18KV.

1       15. The electret in claim 14, wherein a surface  
2 potential thereof is 12 to 55% of the initial surface

3 potential at room temperature for approximately 10 days from  
4 polarization.

1 16. The electret in claim 9, wherein initial surface  
2 potential thereof is between 2820 and 2950V when polarized  
3 by corona discharge under potential difference of  
4 approximately 18KV.

1 17. The electret in claim 1, wherein a surface  
2 potential thereof is 50 to 55% of the initial surface  
3 potential at room temperature for approximately 10 days from  
4 polarization.

1 18. An electret composite, comprising:  
2 a substrate; and  
3 an electret coated on the substrate, the electret  
4 having a first polymer copolymerizing from  
5 monomers having VdF as a first monomer, and HFP,  
6 CTFE, TFE, or combinations thereof as a second  
7 monomer.

1 19. The composite as claimed in claim 18, wherein the  
2 substrate comprises polyethylene, polypropylene,  
3 poly(butylene terephthalate), polytetrafluoroethylene,  
4 poly(tetrafluoroethylene/ethylene), or polystyrene.

1 20. The composite as claimed in claim 19, wherein the  
2 substrate is film, plate, or, nonwoven or woven fiber.

1 21. The composite as claimed in claim 18, wherein the  
2 content of VdF in the first polymer is between 10 mole% and  
3 80 mole%.

1        22. The composite as claimed in claim 18, wherein the  
2 content of HFP in the first polymer is approximately 30  
3 mole% or less.

1        23. The composite as claimed in claim 18, wherein the  
2 content of CTFE in the first polymer is approximately 30  
3 mole% or less.

1        24. The composite as claimed in claim 18, wherein the  
2 content of TFE in the first polymer is approximately 40  
3 mole% or less.

1        25. The composite as claimed in claim 18, wherein the  
2 monomers further comprise a third monomer comprising  
3 cyclohexyl vinyl ether, 4-hydroxybutyl vinyl ether, ethyl  
4 vinyl ether, methyl methacrylate, butyl acrylate, 2-hydroxy  
5 ethyl methacrylamide, glyceryl methacrylamide, acrolein,  
6 butyl vinyl ether, propionic vinyl ether,  $\alpha,\alpha$ -  
7 dimethylpropionic vinyl ether, or combinations thereof.

1        26. The composite as claimed in claim 25, wherein the  
2 content of the third monomer in the first polymer is  
3 approximately 30 mole% or less.

1        27. The composite as claimed in claim 18, wherein the  
2 content of fluorine element in the first polymer is between  
3 60 and 76 wt%.

1        28. The composite as claimed in claim 18, wherein the  
2 electret further comprises a second polymer mixed with the  
3 first polymer, the second polymer comprising  
4 polymethacrylate, polyvinyl acetate, polycarbonate,

5 polyurethane, polyester, polyimide, poly(butylene  
6 terephthalate), or polystyrene.

1 29. The composite as claimed in claim 28, wherein the  
2 content of second polymer in the electret is approximately  
3 60 wt% or less.

1 30. The composite as claimed in claim 18, wherein the  
2 electret is porous material.

1 31. The composite as claimed in claim 18, wherein the  
2 electret is porosified by solvent, supercritical fluid, or  
3 thermal decomposition.

1 32. The composite as claimed in claim 18, wherein the  
2 substrate is coated with the electret by a solvent or direct  
3 heating method.

1 33. The composite as claimed in claim 32, wherein  
2 solvent used in the solvent process is acetone, methyl ethyl  
3 ketone, methyl isobutyl ketone, 1-methyl-2-pyrrolidone,  
4 dimethyl sulfoxide, dimethylformamide, or combinations  
5 thereof.

1 34. The composite as claimed in claim 33, wherein the  
2 solvent process further comprises impregnation, spraying, or  
3 spin-coating.

1 35. The composite as claimed in claim 18, wherein  
2 initial surface potential of the electret is between 1350  
3 and 2950V when polarized by corona discharge under potential  
4 difference of approximately 18KV.

1       36. The composite as claimed in claim 35, wherein a  
2 surface potential of the electret is 12 to 55 percents of  
3 the initial surface potential when standing at room  
4 temperature for approximately 10 days from polarization.

1       37. The composite as claimed in claim 31, wherein  
2 initial surface potential of the electret is between 2820  
3 and 2950V when polarized by corona discharge under potential  
4 difference of approximately 18KV.

1       38. The composite as claimed in claim 31, wherein a  
2 surface potential of the electret is 50 to 55% of the  
3 initial surface potential at room temperature for  
4 approximately 10 days from polarization.

1       39. An electret composite, comprising:  
2           a porous substrate; and  
3           an electret coated on the substrate along the profile  
4           thereof, the electret having a first polymer  
5           copolymerizing from monomers having VdF as a  
6           first monomer, and HFP, CTFE, TFE, or  
7           combinations thereof as a second monomer.

1       40. The composite as claimed in claim 39, wherein the  
2 substrate comprises a nonwoven or woven fabric of  
3 polyethylene terephthalate, polyethylene, polypropylene,  
4 polytetrafluoroethylene, polystyrene, or polyvinyl chloride.

1       41. The composite as claimed in claim 39, wherein the  
2 content of VdF in the first polymer is between 10 mole% and  
3 80 mole%.

1       42. The composite as claimed in claim 39, wherein the  
2 content of HFP in the first polymer is approximately 30  
3 mole% or less.

1       43. The composite as claimed in claim 39, wherein the  
2 content of CTFE in the first polymer is approximately 30  
3 mole% or less.

1       44. The composite as claimed in claim 39, wherein the  
2 content of TFE in the first polymer is approximately 40  
3 mole% or less.

1       45. The composite as claimed in claim 39, wherein the  
2 monomers further comprise a third monomer comprising  
3 cyclohexyl vinyl ether, 4-hydroxybutyl vinyl ether, ethyl  
4 vinyl ether, methyl methacrylate, butyl acrylate, 4-hydroxyl  
5 ethyl methacrylamide, glyceryl methacrylamide, acrolein,  
6 butyl vinyl ether, propionic vinyl ether,  $\alpha,\alpha$ -  
7 dimethylpropionic vinyl ether, or combinations thereof.

1       46. The composite as claimed in claim 45, wherein the  
2 content of the third monomer in the first polymer is  
3 approximately 30 mole% or less.

1       47. The composite as claimed in claim 39, wherein the  
2 content of fluorine element in the first polymer is between  
3 60 and 76 wt%.

1       48. The composite as claimed in claim 39, wherein the  
2 electret further comprises a second polymer mixed with the  
3 first polymer, the second polymer comprising  
4 polymethacrylate, polyvinyl acetate, polycarbonate,

5 polyurethane, polyester, polyimide, poly(butylene  
6 terephthalate), or polystyrene.

1 49. The composite as claimed in claim 39, wherein the  
2 content of second polymer in the electret is approximately  
3 60 wt% or less.

1 50. The composite as claimed in claim 39, wherein the  
2 substrate is coated by dissolving the electret in acetone,  
3 methyl ethyl ketone, methyl isobutyl ketone, 1-methyl-2-  
4 pyrrolidone, dimethyl sulfoxide, dimethylformamide, or  
5 combinations thereof to form a solution, immersing the  
6 substrate in the solution, taking the substrate from the  
7 solution, and evaporating the solution therefrom.

1 51. The composite as claimed in claim 39, wherein a  
2 initial surface potential of the electret is between 2820  
3 and 2950V when polarized by corona discharge under potential  
4 difference approximately 18KV.

1 52. The composite as claimed in claim 51, wherein a  
2 surface potential of the electret is 50 to 55% of the  
3 initial surface potential at room temperature for  
4 approximately 10 days from polarization.